AMENDMENTS TO THE DRAWINGS

The Examiner is requested to replace Figs. 1, 3, 4 and 5 with amended drawing sheets containing amended Figs. 1, 2, 3 4 and 5 submitted herewith.

REMARKS

This is in reply to the Office Action dated January 14, 2008, for which a response was originally due on April 14, 2008. A two month extension of time is being obtained to extend to the due date until Saturday, June 14, 2008, and this response is being timely filed on Monday, June 16, 2008.

In the Office Action, the Examiner had objected to the Information Disclosure Statement filed October 14, 2005, Figs. 1 to 5 and the abstract and had also rejected claims 1 to 23 as being unpatentable over Rose (U.S. Patent No. 6,195,561 B1) in view of Sohner et al. (U.S. Patent No. 5,187,803). Reconsideration and continued examination of the above-identified application is respectfully requested.

Replacement of Information Disclosure Statement

Submitted herewith is a replacement Information Disclosure Statement containing a concise explanation of the relevance, at it is presently understood, of the reference JP-2002190755 identified by the Examiner. It is understood that the Examiner had accepted the other references referred to in the Information Disclosure Statement.

Amendments to the Drawings

The Examiner had requested that elements 27, 30, 40 and 90 in Figures 1 to 4 and element 510 in Figure 5 be identified with suitable descriptive legends. The Figures have been amended as requested by the Examiner to contain descriptive legends for these elements. The Examiner will appreciate that the drawings, in many cases, contained more than one of the same elements, such as the amplification unit 30. In this case, to avoid clutter in the drawing, a descriptive legend has been included next to only one of the element numbers 30. It is believed that the drawings now comply with 37 CFR 1.84(o). If the Examiner or Draftsperson requests better quality formal drawings, they can be prepared in response to the Notice of Allowance.

Amendment to the Specification

The Examiner had objected to the abstract on the basis that it contains more than 150 words. The abstract has been amended as requested by the Examiner.

Clarity of the Claims

While not objected to by the Examiner, claim 2 has been amended to more clearly define the present invention. In particular, claim 2 has been amended to replace "wherein" with --wherein the first fault frequency is--. This corrects a clerical error in claim 2 and improves the clarity of the claim.

No other amendments have been made to the claims.

35 USC § 103(a) Rejection

The applicant respectfully submits that Rose and Sohner, alone or in combination with any other cited references, fail to anticipate or render obvious the pending claims. As will be described more fully below, the Rose and Sohner references fail to teach, suggest or disclose each and every claimed limitation.

The claims of the present application are directed to a radio frequency communication system for communicating the signals. The radio frequency communication system includes a radiating transmission line, a base station coupled to a first end of the radiating transmission line, at least two amplification units coupled to the transmission line at periodic locations for amplifying the first communication signal at the first frequency and a degradation unit for detecting a degradation in the communication system between the at least two amplification units, and "wherein upon detection of a degradation in the communication system between any two amplification units, the amplification units detecting the degradation **change the frequency** of the first communication signal along the radiating transmission line between the two amplification units having detected the degradation **from the first frequency to a predetermined first fault frequency** to facilitate overcoming the degradation of a

communication system" [emphasis added] as recited in claim 1, for example. In contrast, Sohner does not teach, suggest or disclose that the frequencies are changed from the first communication signal from the first frequency to a predetermined first fault frequency upon detection of a degradation, nor does Sohner teach, suggest or disclose that this is done to facilitate overcoming the degradation in a communication system. Rather, Sohner clearly states that the radio frequency signals, the pilot frequency and the IF frequencies all emanate from each amplifier all of the time. In this regard, reference is respectfully made to the following passages from Sohner for the Examiner's convenience:

> In accordance with an important aspect of this invention, an intermediate frequency (IF) distribution system is used instead of amplifying the propagated signals directly at the original RF frequency levels. The result is to restrict the cascading effect occurring due to the plurality of cascaded amplifier stages to the relatively low power IF signals. [emphasis added] see Sohner column 7, lines 1 to 7
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> More specifically, at the base station location, the RF carrier signals which are to be transmitted across the radiating cable are downconverted to a predefined IF level prior to transmission over the radiating cable lengths. An arrangement for accomplishing this result is shown in FIG. 2, where signals from transmitting units at the base station 20 are fed to a conventional mixer 22. The other input to the mixer 22 is a pilot signal generated by a pilot generator 24 in conjunction with an associated local oscillator 26. The frequency of the pilot tone is selected to be such that the input RF frequency signals to the mixer are effectively down-converted to the desired IF level. [emphasis added] column 7, lines 10 to 22.
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> A narrow band of signals from the down-converted IF signals are filtered by using a band pass filter (BPF) 28 and are fed through an appropriate load 30 to an amplifier 32. The signal generated by the pilot generator 24 is also fed to a summing unit 34 which receives its other input from the output of amplifier 32. The output of the summing unit 34 represents the combination of the filtered IF signals and the pilot signal, and is applied to the radiating cable 16 for transmission through the tunnel area. The pilot signal is sent over the radiating cable 16 for use by the subsequent amplifier stages. [emphasis added] column 7, lines 23 to 33
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> . . .

> At each of the amplifier stages, the IF signals being propagated across the radiating cable lengths are up-converted to the original RF frequency through a mixing operation using a local oscillator signal derived from the reference pilot signals also transmitted over the radiating cable. A representative arrangement for accomplishing this is shown at FIG. 3, where the transmit RF signals are passed through a bi-directional signal splitter (or combination divider/summer) 40. In the transmit direction, the RF signals pass through a signal divider 42, one output of which leads to a band pass filter 44 which allows a selected band of frequencies to pass through to a mixer 46. [emphasis added] column 7, lines 34 to 46.
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> Signals from the divider 42 are also passed through a low pass filter 58 which passes only the IF signals which need to be propagated downstream of the amplifier stage for subsequent regeneration of the RF frequencies. The filtered IF signals pass through a variable attenuator 60 and a preamplifier 62 which provides the requisite IF gain before being applied to the final power amplifier 56. The amplified IF signals are subsequently transmitted over the radiating cable **along with** the RF signals. [emphasis added] column 7, line 63 to column 5, line 4.

In Sohner, the radiating transmission line carries the amplified signals along with the RF signals [column 8, lines 2 to 4 of Sohner]. Furthermore, the output of the summing unit 34 represents a combination of the filtered IF signals and the pilot signal and this is applied to the radiating cable for transmission through the tunnel area [see column 7, lines 28 to 32]. Thus, during normal operation in Sohner, signals having all three frequencies, namely the RF signals, the amplified IF signals as well as the pilot signal are all transmitted over the radiating cable together. This is done in order to restrict a cascading effect occurring due to the plurality of cascaded amplifier stages (see column 7, lines 5 to 7). In other words, only the lower power IF signals will be subsequently regenerated at the RF frequencies, but all of the signals, namely the IF signals, the RF signals and the pilot signal are transmitted over the radiating cable.

Accordingly, it is respectfully submitted that Sohner does not teach, suggest or disclose the features of "upon detection of a degradation in a communication system between any two amplification units, the amplification units detecting the degradation **change** frequency of the first communication signal along the radiating transmission line between the two amplification units having detected the degradation from the first frequency to a predetermined first fault frequency to facilitate overcoming a degradation in a communication system". There

is no disclosure in Sohner of any manner of changing the frequency of the first communication signal upon detecting a degradation. Moreover, there is no disclosure in Sohner of changing the frequency of the first communication signal between the two amplification units having detected the degradation from the first frequency to a predetermined first fault frequency to facilitate overcoming a degradation in the communication system. Rather, in Sohner, the signals at the pilot frequency, the IF frequency and the RF signals are always transmitted across all of the amplification units, whether or not a degradation is detected.

Moreover, the pilot frequency in Sohner does not transmit a communication signal. Rather, as clearly disclosed in Sohner, the "pilot signal is sent over the radiating cable 16 for use by the subsequent amplifier stages" [see column 7, lines 32 to 33]. Moreover, the IF signal is the transmission of the RF signal, but this is not done in order to overcome a degradation, but rather this is done as the normal operation of this system to attempt to restrict the cascading effect occurring during the plurality of cascaded amplifier stages.

In addition, there is no RF signal being transmitted through any of the amplifiers of Sohner. This is different from the present claims which clearly recite that the "at least two amplification units coupled to said transmission line at periodic locations for amplifying the first communication signal at the first frequency from previous amplification units".

Moreover, there is no disclosure in Sohner that the IF signal can be used to overcome a degradation in the communication system. Rather, if a degradation did occur, as contemplated by the present application, both the IF signals and the RF signals, as well as the pilot signal, would not be transmitted thereby causing Sohner to fail. At best, upon detection of a degradation, Sohner may issue control and commands to the amplifier to change the gain in order to compensation for the degradation, but Sohner does not teach, suggest or disclose changing the frequency of the communication signal upon detection of a degradation. Moreover, Sohner would fail if the radiating cable is cut. Sohner would also fail if one ore more of the amplifiers is faulty, such as if the amplifier ignores the gain change command.

Furthermore, the applicant respectfully submits that this is a non-trivial distinction in that the design of the present system improves the ability for the system to detect and overcome degradations which is a problem of the prior art approaches including Sohner and Rose. In direct contrast, upon detection of a degradation, the present invention as claimed by claim 1 would alter the frequency from the first frequency to the predetermined first fault frequency. This would permit the communication signal to still transmit by using the radiating line as an antenna and jumping over the degradation. Therefore, in the present system, if the cable is cut, or if an amplifier fails, such a degradation would be detected and the frequency of the communication signal would be changed from the first frequency to the first fault frequency. This would overcome the degradation by using the radiating line itself as an antenna. The fact that the communication signal would be at the first fault frequency would facilitate overcoming the degradation of a communication system as recited in the claim and described more fully in the present disclosure. In direct contrast, the pilot signals and IF signals of Sohner are non-radiating. This is the case to avoid cascading. As the IF signals and pilot signals of Sohner are non-radiating, Sohner clearly teaches away from the present invention.

As such, the applicant submits that the cited reference to Sohner and Rose fail to anticipate or render obvious to claims as recited in the present application and the application is now in a condition for allowance. The applicant further submits that the dependent claims are allowable by virtue of depending on the allowable base claims.

Moreover, reference is respectfully made to at least dependent claim 5. Claim 5 recites additional features of a radio frequency communication system including that "upon detection of a degradation and the length of the transmission line at the upstream connection, the amplification unit commences to transmit the first communication signal at the predetermined first fault frequency and increases a power level of the first communication signal to facilitate radiation of the first communication signal from a first portion of the radiating transmission line downstream of the degradation to be received by a second portion of the radiating transmission line upstream of the degradation". Accordingly, claim 5 further recites that, upon detection of a degradation and the length of the transmission line at the upstream connection, the amplification

unit commences to transmit the first communication signal at the predetermined first fault frequency, but also increases the power level of the first communication signal to facilitate radiation of the first communication signal from a portion of the radiating transmission line downstream of the degradation to be received by a second portion of the radiating transmission line upstream of the degradation. In this way, the communication signal is transmitted across the degradation from the first portion of the radiating transmission line to the second portion of the radiating transmission line thereby overcoming the degradation. The Examiner will appreciate that the Sohner reference does not teach, suggest or disclose changing the frequency from the first frequency to the predetermined first fault frequency. This is the case at least for the above reasons, including the fact that the IF signal and pilot signal in Sohner are non-radiating and therefore could not be transmitted across a degradation. At best, Sohner discloses increasing the gain. However, in the case where there is a degradation in the length of the transmission line, increasing the gain will not be sufficient and both the RF signal and the IF signal, as well as the pilot signal, would not be transmitted across the length of cable in the system disclosed in Sohner. In direct contrast, in the system defined by the present claims, including claim 5, the signal would be transmitted from one portion of the radio transmission line to the other portion of the radiating transmission line thereby overcoming the degradation. The Examiner will also appreciate that this is a non-trivial distinction over Sohner. The Examiner will also appreciate that a degradation, such as in a mine, may result from an explosion or other catastrophic event and the ability to transmit and receive communication signals in a mine during such an event can be crucial in locating and saving persons located in the mine.

It is noted that present independent claims 16 and 20 also recite subject matter similar to claim 1 and therefore recite patentably distinguishable subject matter in view of Sohner and Rose, whether taken singly or combined, at least for the same reasons as stated above with respect to claim 1. As the remaining claims are directly or indirectly dependent from claims 1, 16 and 20, it is respectfully submitted that all of the claims define patentably distinguishable subject matter in view of the cited references including Sohner and Rose at least for the above reasons. If there are any remaining questions regarding this submission or the application in

general, a telephone call to the undersigned would be appreciated since this would expedite the prosecution of this application for all concerned.

It is submitted that the foregoing amendments are such as to comply with the formal matters raised in the Official Action and this application is in a condition for allowance.

CONCLUSION

If for any reason the Examiner is of the view that this application is not in a condition for allowance, the Examiner is requested to telephone the undersigned at (416) 961-5000 so that an interview or telephone conference may be arranged to expedite allowance of this case.

It is hereby petitioned under 37 CFR 1-1336 that the response term of this application be extended, if necessary, to a date which would include the filing date of the present amendment and the Commissioner is hereby authorized to charge any necessary extension fee to deposit account no. 18-1350, under an order number corresponding to attorney docket number P24304.

Favourable consideration and disposition is respectfully requested.

Respectfully requested

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JP/cbc
Encl.
Ret. Ack. Card
Abstract
Figures 1 to 5

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CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office Fax No. (571) 273-8300 on June 16, 2008.

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Jeffrey Pervanas